(II) REPRODUCTION

→ Can be asexual / sexual

→ Asexual reproduction is unisparental which can occur by binary fission, spore form^{n}, fragmentation and vegetative propagation.

In lower organisms like yeast and Hydra we see budding.

yeast → unicellular budding

Hydra → multicellular budding.

In Planaria (flatworm), true regeneration occurs i.e, the fragmented organism regenerates the lost part of its body and becomes new organism.

Fungi, filamentous algae and protonema of mosses multiply by fragmentation.

In unicellular organisms like bacteria, Amoeba etc, reproduction is synonymous with growth i.e., mutually inclusive events (i.e, increase in number cells).

→ In higher developed organisms like plants and animals, sexual reproduction is more common.

In higher plants and animals, growth and reproduction are linked BUT exclusive events.

→ There are living beings which do not reproduce (Eg) mule, worker bees, infertile human etc.

So, reproduction cannot be an all inclusive property of the living organisms. Thereby, not a defining property.

(III) METABOLISM

→ It is the sum total of anabolism + catabolism

→ Metabolic reactions can be performed in-vitro

(eg) in a test-tube.

i.e outside the living system/cell.

→ While metabolism is a defining property of all organisms (because it occurs in all living beings) without exception, isolated metabolic reaction in-vitro are not living things but surely living reactions.

(IV) CELLULAR ORGANISATION / STRUCTURE

→ It represents all the components of a cell in an organised manner.

→ Living organisms are made of one / more cells.

→ This is a defining property of living organisms.

(V) CONSCIOUSNESS

→ It is the response to a stimulus — physical, chemical or biological

→ It is the most important and technically complicated feature of all living organisms.

Consciousness is the most important defining property of living organisms.

→ Human being is the ONLY organism who are self-conscious i.e., responding to stimuli, thinking of past, awareness of surrounding, planning future and taking actions.

(*) Patient lying in coma is actually brain dead and has lost the property of self-consciousness.

NOTE:

(1) Properties of tissues are not present in the constituent cells but arise due to interactions among the constituent cells.

Similarly, the properties of cell organelles are not present in the molecular constituent of the organelle but arise due to interactions

among the molecular constituents.

(2) Living organisms are self-replicating and self-regulating systems capable of responding to stimuli.

(3) All the living organisms — present, past and future are linked to one another by the sharing of comman genetic material (i.e., DNA) but to varying degrees.

Diversity in the Living World

→ Biodiversity refers to the number and types of

organisms on earth.

→ About 1.7 million species have been taxonomically identified

≃ 1.2 million animal species

≃ 0.5 million plant species

* Majority of the species divisity is confined to the trepical rain-forest and in the underwater reef in the tropical Ocean.

TAXONOMY

→ The term taxonomy was given by A. P. de Candolle.

→ The term taxonomy has been derived from the Greek word taxis and nomos.

→ Taxonomy deals with the principles and procedures of classification.

→ Father of taxonomy is Carolus Linnaeus.

→ The basic elements of taxonomy (in sequential steps) :

(i) Characterisation / Description & (ii) Identification

→ It is the determination of similaties of an organism with an already known organism.

(iii) Nomenclature

→ It is the determination of correct Biological / Scientific name.

(iv) Classification

→ It is the grouping of organisms into convinient categories on the basis of easily observable characterx.